

**We Claim:**

1. A method of generating a graphical portion of a graphical user interface (GUI), the method comprising:

illustrating, in the same graphical portion, a tree hierarchy and a table of values;

including, in the tree hierarchy,

one or more nodes belonging to a first node-category and

one or more nodes belonging to a second node-category and corresponding to a group of elements;

adaptively arranging the table, in response to a selection of one of the first-category nodes via the GUI, to include

one or more rows that present information about the one or more second-category nodes, respectively, and that report to the selected one of the first-category nodes, and

one or more columns representing a parameter of one or more the second-category nodes, respectively; and

showing, in the rows, sums of individual values exhibited by elements of the group, respectively.

2. The method of claim 1, the method further comprising:

including, in the tree hierarchy, at least one node belonging to a third node-category;

wherein the one or more first-category nodes report to the at-least-one third-category node, respectively.

3. The method of claim 1, wherein:  
  
the elements in the tree hierarchy represent a component in a storage domain;
4. The method of claim 3, wherein the parameter of the storage-domain component includes one of the following: a number of LUNs to which the element has access; an amount of storage space made available to the element; and a cost per unit time of an amount of storage made available to the element.
5. The method of claim 4, wherein:  
  
one of the one-or-more columns represents the storage-space-amount parameter;  
  
the at-least-one row associated via the at-least-one second-category node with the respective group of elements shows in a cell intersecting the storage-space-amount-parameter column a sum of the storage space represented by the elements of the group.
6. The method of claim 1, further comprising:  
  
splitting the graphical portion into a first pane and a second pane;  
  
the first pane containing the tree hierarchy; and  
  
the second pane containing the table.
7. The method of claim 1, wherein:  
  
the rows of the table are a first type of row; and

the method further comprises

including in the table a second type of row that presents information about the selected one of the first-category nodes.

8. The method of claim 7, wherein:

the second-type row has a cell corresponding to each of the one or more columns, respectively; and

the method further comprises

showing, for each of the one-or-more cells of the second-type row, a sum of the values in the corresponding cells of the first-type rows.

9. The method of claim 1, further comprising:

illustrating a title for the table, the title being an at least partial pathname to the selected one of the first-category nodes, the pathname including at least an identifier of a third level node to which the selected one of the first-category nodes reports.

10. The method of claim 1, further comprising:

including, in the tree hierarchy, a node belonging to a third node-category, the first-category nodes reporting to the third-category node;

wherein

the tree hierarchy concerns various-type components of a storage domain,

the third-category node represents the total instances of a particular type among the storage-domain components, and

each of the second-category nodes represents a subset of the total instances of the particular type of storage-domain component.

11. The method of claim 1, wherein the table is formed of multiple tabbed subtables.

12. A method of generating a graphical portion of a graphical user interface (GUI), the graphical portion concerning various components of a storage domain, the method comprising:

illustrating a tree hierarchy;

including, in the tree hierarchy, a node belonging to a first node-category, the first-category node representing the total instances of a particular type among the storage-domain components, and

including, in the tree hierarchy, one or more subset nodes belonging to a second node-category reporting to the first-category node, each second-category subset node representing a subset of the total instances of the particular type of storage-domain component.

13. The method of claim 12, wherein the type of storage-domain component is one of the following: a storage area network (SAN); an interconnect device; a storage device; a host; and a business application.

14. The method of claim 12, further comprising:

illustrating, in the tree hierarchy, one or more instance nodes belonging to the second node-category that reports to the first-category node, each

second-category instance node representing a particular instance among the total instances of the particular type of storage-domain component.

15. The method of claim 12, further comprising:

illustrating, in the tree hierarchy, one or more instance nodes belonging to a third node-category reporting to the second-category subset nodes, respectively, each third-category instance node representing a particular instance among the subset of instances of the corresponding second-category subset node.

16. The method of claim 12, further comprising:

illustrating, in the tree hierarchy, a node a third node-category corresponding to the storage-domain as a whole, each first-category node reporting to the third-category node.

17. A machine-readable medium including instructions execution of which by a host produces a graphical portion of a graphical user interface (GUI), the machine-readable instructions comprising:

a code segment for illustrating, in the same graphical portion, a tree hierarchy and a table of values;

a code segment for including, in the tree hierarchy,

one or more nodes belonging to a first node-category and

one or more nodes belonging to a second node-category and corresponding to a group of elements;

a code segment for adaptively arranging the table, in response to a selection of one of the first-category nodes via the GUI, to include

one or more rows that present information about the one or more second-category nodes, respectively, and that report to the selected one of the first-category nodes, and

one or more columns representing a parameter of one or more the second-category nodes, respectively; and

a code segment for showing, in the rows, sums of individual values exhibited by elements of the group, respectively.

18. The machine-readable instructions of claim 17, the machine-readable instructions further comprising:

a code segment for including, in the tree hierarchy, at least one node belonging to a third node-category;

wherein the one or more first-category nodes report to the at-least-one third-category node, respectively.

19. The machine-readable instructions of claim 17, wherein:

the elements in the tree hierarchy represent a component in a storage domain;

20. The machine-readable instructions of claim 19, wherein the parameter of the storage-domain component includes one of the following: a number of LUNs to which the element has access; an amount of storage space made

available to the element; and a cost per unit time of an amount of storage made available to the element.

21. The machine-readable instructions of claim 20, wherein:

one of the one-or-more columns represents the storage-space-amount parameter;

the at-least-one row associated via the at-least-one second-category node with the respective group of elements shows in a cell intersecting the storage-space-amount-parameter column a sum of the storage space represented by the elements of the group.

22. The machine-readable instructions of claim 17, further comprising:

a code segment for splitting the graphical portion into a first pane and a second pane;

the first pane containing the tree hierarchy; and

the second pane containing the table.

23. The machine-readable instructions of claim 17, wherein:

the rows of the table are a first type of row; and

the machine-readable instructions further comprise

a code segment for including in the table a second type of row that presents information about the selected one of the first-category nodes.

24. The machine-readable instructions of claim 23, wherein:

the second-type row has a cell corresponding to each of the one or more columns, respectively; and

the machine-readable instructions further comprise

a code segment for showing, for each of the one-or-more cells of the second-type row, a sum of the values in the corresponding cells of the first-type rows.

25. The machine-readable instructions of claim 17, further comprising:

a code segment for illustrating a title for the table, the title being an at least partial pathname to the selected one of the first-category nodes, the pathname including at least an identifier of a third level node to which the selected one of the first-category nodes reports.

26. The machine-readable instructions of claim 17, further comprising:

a code segment for including, in the tree hierarchy, a node belonging to a third node-category, the first-category nodes reporting to the third-category node;

wherein

the tree hierarchy concerns various-type components of a storage domain,

the third-category node represents the total instances of a particular type among the storage-domain components, and

each of the second-category nodes represents a subset of the total instances of the particular type of storage-domain component.



27. The machine-readable instructions of claim 17, wherein the table is formed of multiple tabbed subtables.

28. A machine-readable medium including instructions execution of which by a host produces a graphical portion of a graphical user interface (GUI), the graphical portion concerning various components of a storage domain, the machine-readable instructions comprising:

- a code segment for illustrating a tree hierarchy;

- a code segment for including, in the tree hierarchy, a node belonging to a first node-category, the first-category node representing the total instances of a particular type among the storage-domain components, and

- a code segment for including, in the tree hierarchy, one or more subset nodes belonging to a second node-category reporting to the first-category node, each second-category subset node representing a subset of the total instances of the particular type of storage-domain component.

29. The machine-readable instructions of claim 28, wherein the type of storage-domain component is one of the following: a storage area network (SAN); an interconnect device; a storage device; a host; and a business application.

30. The machine-readable instructions of claim 28, further comprising:

- a code segment for illustrating, in the tree hierarchy, one or more instance nodes belonging to the second node-category that reports to the first-category node, each second-category instance node representing a particular

instance among the total instances of the particular type of storage-domain component.

31. The machine-readable instructions of claim 28, further comprising:

a code segment for illustrating, in the tree hierarchy, one or more instance nodes belonging to a third node-category reporting to the second-category subset nodes, respectively, each third-category instance node representing a particular instance among the subset of instances of the corresponding second-category subset node.

32. The machine-readable instructions of claim 28, further comprising:

a code segment for illustrating, in the tree hierarchy, a node a third node-category corresponding to the storage-domain as a whole, each first-category node reporting to the third-category node.

33. An apparatus for managing components of a system, the apparatus comprising:

a host operatively connected to the components of system; and

manager means for running on the host and for managing the components of the system in part by producing a graphical user interface (GUI); and

generation means for generating a graphical portion of the GUI, the generation means being operable to

portray, in the same graphical portion, a tree hierarchy and a table of values;

portray, in the tree hierarchy,

one or more nodes belonging to a first node-category and

one or more nodes belonging to a second node-category and

corresponding to a group of elements;

adaptively dispose the table, in response to a selection of one of the first-category nodes via the GUI, to include

one or more rows that present information about the one or more second-category nodes, respectively, and that report to the selected one of the first-category nodes, and

one or more columns representing a parameter of one or more the second-category nodes, respectively; and

portray, in the rows, sums of individual values exhibited by elements of the group, respectively.

34. The apparatus of claim 33, wherein:

the system is a storage domain and the elements in the tree hierarchy represent a component in a storage domain;

35. The apparatus of claim 34, wherein a parameter of the storage-domain component includes one of the following: a number of LUNs to which the element has access; an amount of storage space made available to the element; and a cost per unit time of an amount of storage made available to the element.

36. The apparatus of claim 35, wherein:

one of the one-or-more columns represents the storage-space-amount parameter; and

the at-least-one row associated via the at-least-one second-category node with the respective group of elements shows in a cell intersecting the storage-space-amount-parameter column a sum of the storage space represented by the elements of the group.

37. The apparatus of claim 33, wherein:

the rows of the table are a first type of row; and

the generation means is further operable to dispose, in the table, a second type of row that presents information about the selected one of the first-category nodes.

38. The apparatus of claim 37, wherein:

the second-type row has a cell corresponding to each of the one or more columns, respectively; and

the generation means is further operable to dispose, for each of the one-or-more cells of the second-type row, a sum of the values in the corresponding cells of the first-type rows.

39. An apparatus for managing components of a storage domain, the apparatus comprising:

a host operatively connected to the components of the storage domain;  
and

storage area manager (SAM) means for running on the host and for managing the components of the storage domain in part by producing a graphical user interface (GUI); and

generation means for generating a graphical portion of the GUI, the graphical portion concerning various components of a storage domain, the generation means being operable to

portray a tree hierarchy;

portray, in the tree hierarchy, a node belonging to a first node-category, the first-category node representing the total instances of a particular type among the storage-domain components, and

portray, in the tree hierarchy, one or more subset nodes belonging to a second node-category reporting to the first-category node, each second-category subset node representing a subset of the total instances of the particular type of storage-domain component.

40. The apparatus of claim 39, wherein the type of storage-domain component is one of the following: a storage area network (SAN); an interconnect device; a storage device; a host; and a business application.

41. The apparatus of claim 39, wherein the generation means is further operable to dispose, in the tree hierarchy, one or more instance nodes belonging to the second node-category that reports to the first-category node, each second-category instance node representing a particular instance among the total instances of the particular type of storage-domain component.

42. The apparatus of claim 39, wherein the generation means is further operable to dispose one or more instance nodes belonging to a third node-category reporting to the second-category subset nodes, respectively, each third-category instance node representing a particular instance among the subset of instances of the corresponding second-category subset node.

43. The apparatus of claim 39, wherein the generation means is further operable to dispose a node a third node-category corresponding to the storage-domain as a whole, each first-category node reporting to the third-category node.

44. A method of generating a graphical portion of a graphical user interface (GUI), the method comprising:

- illustrating, in the same graphical portion, a tree hierarchy and a constellation of values;

- including, in the tree hierarchy,

- one or more nodes belonging to a first node-category and

- one or more nodes belonging to a second node-category and corresponding to a group of elements;

- adaptively arranging the constellation, in response to a selection of one of the first-category nodes via the GUI, to include

- regions that present information about the one or more second-category nodes, respectively, and that report to the selected one of the first-category nodes, and

the regions being organized in terms of one or more parameters of one-or-more of the second-category nodes, respectively; and

showing, in the regions, sums of individual values exhibited by elements of the group, respectively.

45. The method of claim 44, wherein the regions define the constellation as a table in which:

one or more rows present information about the one or more second-category nodes, respectively, that report to the selected one of the first-category nodes; and

the one or more parameters are represented via one or more columns, respectively; and

the sums of individual values for the one or more parameters exhibited by elements of the group, respectively, are shown in the rows.

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